43. (Amended) A grid, adaptable for use with an electromagnetic energy emitting device, comprising:

at least one metal layer comprising:

top and bottom surfaces; and

a plurality of periodic, integrated, intersecting walls, each of which extending from said top to bottom surface and having a plurality of side surfaces, said side surfaces of the walls being arranged to define a plurality of openings extending entirely through the layer, at least one of said openings being non-square shaped, and said intersecting walls forming said openings in a periodic pattern in a first direction along said top surface and in a direction perpendicular to said first direction.

45. (Amended) A grid as claimed in claim 43, wherein:

said at least one intersection point of said intersecting walls including additional wall material which extends into at least one of said openings.

REMARKS

Entry of the above amendments, and reconsideration and allowance of the above identified application are respectfully requested. Upon entry of this amendment, claims 1-4 and 6-45 will be pending in the application.

In the final Office Action, claims 1-30 and 37-45 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Claims 1-30 and 37-45 have been rejected under 35 U.S.C. §103 as being unpatentable in view of U.S. Patent No. 5,263,075 to McGann et. al (the "McGann" patent). Also, claims 31-36 have been rejected under 35 U.S.C. §103 as being unpatentable in view of U.S. Patent No. 5,418,833 to Logan (the "Logan" patent). Applicant respectfully traverses all these rejections, and submits the following for consideration by the Examiner. In particular, Applicant submits that the claims have been amended as indicated above to clarify the details of the "projection" feature previously recited in the claims, as was suggested by the Examiner. It is believed that the arguments submitted in the response to the previous Office Action pertaining to the "projections" applies to the "additional wall material" as explicitly defined in the amended

claims. It is therefore believed that the McGann and Logan patents fail to teach or suggest metallic grids having this additional wall material at the intersection points of the walls.

The claimed embodiments of the present invention will now be described in more detail.

As discussed in the Remarks of the response to the previous Office Action, the embodiment of the present invention as recited in independent claims 1, 27, 31, 37 and 43 provides a grid that is adaptable for use with an electromagnetic energy admitting device, and comprises at least one metal layer. The metal layer includes top and bottom surfaces, and a plurality of integrated intersecting walls that extend from the top and bottom surface and are arranged to define a plurality of openings extending entirely through the layer. Additionally, there is at least one intersecting point of said intersecting walls. As specifically recited in claim 1, at least one of the intersecting points of said intersecting walls includes additional wall material which extends into at least one of said openings. As specifically recited in claim 27, the method for minimizing scattering of electromagnetic energy in an electromagnetic imaging device includes moving the grid in a grid moving pattern while said electromagnetic energy emitting source is emitting energy toward said imager. As specifically recited in claim 31, the method for minimizing scattering of electromagnetic energy in an electromagnetic imaging device includes placing a grid that comprises openings having a non-square shape at said top surface between an electromagnetic energy emitting source of the electromagnetic imaging device and said imager. As specifically recited in claim 37, the method for making the grid includes the step of applying a resist coating onto a substrate surface. As specifically recited in claim 43, at least one of the openings is non-square shaped, and the openings are arranged in a periodic pattern.

As discussed below, Applicant submits that all the pending claims are definite and allowable, especially in that the phrase "additional wall material" is fully supported by the specification. Also, both Logan and McGann fail to teach grid openings with projections, and Logan fails to teach use of a metal grid that is the same or similar to that of the Applicant's. The rejection will now be discussed in more detail.

The 35 U.S.C. §112 Second Paragraph Rejection

Applicant respectfully submits that claims 1-30 and 37-45 are definite and indeed particularly point out and distinctly claim the subject matter of the invention. The Examiner has

alleged that the claim feature "projection" is not only not supported in the specification, but that "the invention from a technological perspective is not grounded in wall projections but rather in the nature of the intersections of the walls". The Applicant respectfully submits that the meaning of the "additional wall material" recited in the amended claims is not unclear and is fully supported in the specification.

The Examiner will note that "[i]t is well established that claims are not read in a vacuum, and limitations herein are to be interpreted in light of the specification in giving them their broadest reasonable interpretation." *In re Marosi*, 218 USP 289, 292 (Fed. Cir. 1983), *In re Snead & Young*, 218 USPQ 385, 3888 (Fed. Cir. 1983).. Furthermore, "[i]n determining the meaning of patent claims, words in a claim will be given their ordinary and accustomed meaning unless it appears that the inventor used them differently." *Jonsson v. The Stanley Works*, 14 USPQ2d 1863, 1870 (Fed. Cir. 1990). Therefore, the Applicant refers the Examiner to the specification and common usage of the claim feature phrase "additional wall material" to provide that the claim feature is definite and is disclosed in the specification.

The phrase "additional wall material" reads on the discussion of the detailed description, and in particular the phrases "adding additional cross-section areas to the grid" and "when square pieces in the shape of the septa are added to the grid" as found on page 14; "add additional grid area at each corner" and "[t]he general rule is that the overlapping grid region **C** formed by grid walls A and B has to be "added back" to the grid intersecting region" as found on page 15; and as shown in Figs. 7, 8, 10, and 12-16. Further reference is made to the added wall material in the specification: "The principle is based on *adding additional cross-sectional areas* to the grid to adjust for the increase of the primary radiation caused by the overlapping of the grid walls. *These additional cross-sectional areas added to the grid,* as described in this paragraph and herein, may be referred to as 'projections'." Specification, page 14 (emphasis added).

Referring to Figs. 8 and 10, it is clear to see that the "added back" portion mentioned above is "additional wall material" formed in the metal plate that makes up the grid array. In the first instance of Fig. 10, the additional wall material are squares, and in the second instance of Fig. 12, the additional wall material are triangles. Further, Figs. 12-16 show the "added back" additional wall material of other examples. This is discussed in detail in the specification on page 16, lines 19-25.

The Abstract of the Invention also refers, albeit indirectly, to this additional wall material: "The side surfaces of the solid integrated walls are arranged to define a plurality of openings extending entirely through the layer. At least some of the walls also can include projections extending into the respective openings formed by the walls. The projections can be of various shapes and sizes, and are arranged so that *a total amount of wall material intersected by a line* propagating in a direction along an edge of the grid is substantially the same as *another total amount of wall material intersected by another line* propagating in another direction substantially parallel to the edge of the grid at any distance from the edge." Specification, page 38, lines 6-13 (emphasis added).

For all of the above reasons, it is respectfully submitted that the amended claims fully comply with 35 U.S.C. §112, second paragraph, and Applicant respectfully requests the Examiner to withdraw said rejection.

The 35 U.S.C. §103 Rejections Based on McGann

Applicant respectfully submits that claims 1-30 and 37-45 are not rendered unpatentable under 35 U.S.C. §103 in view of McGann, in that McGann fails to teach or disclose all the claim features, including a grid comprising at least one metal layer as specifically recited in independent claims 1 and 43. Furthermore, the McGann patent fails to teach that the metal layer has at least one intersection point in said intersecting walls wherein additional wall material has been added and extends into at least one opening as recited in independent claim 1. Applicant further submits that McGann fails to teach or disclose all the steps of independent claim 27 including placing a grid between an electromagnetic energy emitting source, with the grid comprising (among other items) at least one metal layer, a plurality of solid integrated intersecting walls, having a plurality of side surfaces being arranged to define a plurality of openings, with at least one of the openings including at least one projection extending therein. Additionally, McGann fails to teach or disclose the steps of making a grid according to independent claim 37 including, at least, the steps of applying a resist coating onto a substrate structure, and introducing material into the openings in the remaining portion of the resist material such that the resist material forms the intersecting walls of the at least one layer of the grid with at least one projection extending into the at least one of the openings in the grid.

As discussed above, the McGann patent does not teach or suggest a grid comprising at least one metal layer. Rather, as described, for example, beginning in column 5, line 4 of the McGann patent, the McGann device employs a collimator that includes leaded glass micro-channel plate (MCP) detectors 36. Applicant submits that a leaded glass micro-channel plate is completely unlike a grid including at least one metal layer. For example, in a leaded glass MCP, it is difficult to make a precise pattern of openings at precise locations in the grid. The etching method described in the McGann patent tends to produce unevenly spaced openings of different sizes.

Furthermore, as described in column 5, lines 39-45 of the McGann patent, the individual MCPs are stacked and aligned so that the holes of the adjustment plates *are in exact registration.* Lines 34-45 of column 5 further emphasize that "without proper registration, the collimator will essentially be closed to the passage of x-rays." Applicant respectfully submits, therefore, that the McGann patent teaches away from any projection in the openings as recited in claim 1, and requires that the openings be free of any obstruction. Also, although claim 43 does not recite a projection in any of the openings, as stated above, the MCP 36 of the McGann device is not a metal layer, but rather is made of leaded glass.

In addition, McGann does not teach or disclose a method of making a grid that includes the features of claim 37 which includes making a pattern of photoresist, attaching the photoresist pattern to a substrate structure, whereby the metal walls of the grid are formed in the pattern of the photoresist by electroforming. Instead, McGann discloses a method of manufacturing the high angular resolution collimator that "requires the uses of lead glass micro-channel plate (MCP) detectors" (McGann, col. 5, lines 5-6), which are made up of many bundled channels of optical fibers fused and sliced at their cross section to form a solid core. This is completely unlike the method claimed in claim 37 which discloses use of a substrate structure. Further, even though McGann does disclose the step of etching, McGann does not disclose the step of "introducing material into the openings in the remaining portion of the resist such that the material forms the intersecting walls of the at least one intersection point of said intersecting walls including additional wall material which extends into at least one of said openings."

For all of the above reasons, Applicant submits that claims 1-30 and 37-45 are not rendered unpatentable under 35 U.S.C. §103 in view of McGann, and the Examiner is respectfully urged to withdraw said rejection of the aforementioned claims.

The 35 U.S.C. §103 Rejections Based on Logan

Applicant respectfully submits that claims 31-36 are not rendered unpatentable under 35 U.S.C. §103 in view of Logan in that Logan fails to teach or disclose all the claimed features, including placing a grid, comprising at least one metal layer, between an electromagnetic energy emitting source of the electromagnetic imaging device and said imager, as specifically recited in independent claim 31.

Logan describes an x-ray anti-scatter grid for x-ray imaging, particularly for screening mammography, and a method for fabricating the same. The grid of Logan requires that x-rays incident along a direct path pass through a grid composed of a plurality of parallel or crossed openings, microchannels, grooves, or slots *etched in a substrate, such as silicon, having the walls of the microchannels or slots coated with a high opacity material*, such as gold, while x-rays incident at angles with respect to the slots of the grid, arising from scatter, are blocked.

Logan does not teach or suggest the use of a grid comprised of "*at least one metal layer* including top and bottom surfaces . . ." Instead, Logan teaches that the "[t]he present invention utilizes, for example, anisotropic etching methods to produce deep, narrow slots, openings, grooves, or microchannels in a *grid substrate, such as a silicon (Si) wafer*." Logan, Col., 4, lines 49-52 (emphasis added). Furthermore, Logan describes the manufacture of the grid in detail, but only describes such a process utilizing a silicon wafer. See, for example, column 5, lines 11-17; column 5, lines 39-41; column 5, lines 55-58 and column 6, lines 8-14.

In Logan, the walls of the etched grid are merely "coated with a material of high x-ray opacity (material with a high density and atomic number), such as gold (Au)." Logan, col. 4, lines 65-67. In Logan, the walls are not a solid integrated intersecting wall comprised of metal is described in claim 31. This is far different from the grid claimed in claim 31, which is a grid comprised of "at least *one metal layer including top and bottom surfaces* and a *plurality of solid integrated, intersecting walls*, each of which extend from said top to bottom surface and having a plurality of side surfaces . . ."

For all of the above reasons, Applicant submits that claims 31-37 are not rendered unpatentable under 35 U.S.C. §103 in view of Logan, and the Examiner is respectfully urged to withdraw said rejection of the aforementioned claims.

In view of the above, it is believed that the application is in condition for allowance, and notice to that effect is respectfully requested. Should the Examiner have any questions, he is invited to contact the undersigned at the number indicated below.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

1. (Amended) A grid, adaptable for use with an electromagnetic energy emitting device, comprising:

at least one metal layer comprising:

top and bottom surfaces; and

a plurality of integrated, intersecting walls, each of which extending from said top to bottom surface and having a plurality of side surfaces, said side surfaces of said walls being arranged to define a plurality of openings extending entirely through said layer, and at least one intersection point of said intersecting walls including additional wall material which extends into at least one of said openings [including at least one projection extending therein].

2. (Amended) A grid as claimed in claim 1, wherein:

said intersecting walls form said openings in a periodic pattern in a [first] direction along said top surface and in a direction perpendicular to said [first] direction.

3. (Amended) A grid as claimed in claim 2, wherein:

each of a plurality of said intersecting points of said intersecting walls includes a respective additional material which extends into a respective said opening; and

said [projections are] each respective additional wall material is arranged such that a total amount of material of said walls intersected by a line propagating in a first direction for the length of one period along the grid is substantially the same for any period along the first direction.

4. (Amended) A grid as claimed in claim 2, wherein:

first and second edges extending in first and second directions transverse of each other; and

said [projections are] each respective additional wall material is arranged such that a total amount of material of said walls intersected by a line beginning at said second edge and propagating in a first direction for a first distance including at least one period along the grid and extending substantially parallel to said first edge is substantially the same as another total amount of material of said walls intersected by another line beginning at said second edge at any distance

from a point on said second edge from which the first direction extends and propagating in a second direction, substantially parallel to said first direction, for a second distance substantially equal to said first distance.

6. (Amended) A grid as claimed in claim [5] 1, wherein:

at at least one said intersection point, [two of said projections] said respective additional wall material is configured in a plurality of portions extending in opposite directions into different ones of said openings.

7. (Amended) A grid as claimed in claim 6, wherein:

each of said [projections] plurality of portions of said respective additional wall material have substantially the same area.

8. (Amended) A grid as claimed in claim 6, wherein:

said plurality of portions of said [projections] respective additional wall material have areas different from each other.

9. (Amended) A grid as claimed in claim 1, wherein:

said [projections] additional wall material at at least one said intersection point has two portions, each extending from a different one of said walls.

12. (Amended) A grid as claimed in claim 1, wherein:

said additional wall material at at least one said [projections] intersection point has a side extending in a substantially straight direction between two of said walls.

17. (Amended) A grid as claimed in 1, wherein:

said [projection] additional wall material at each said intersection point is connected to at least one of said walls.

18. (Amended) A grid as claimed in claim 1, wherein:

said [projection] additional wall material at at least one said intersection point is separated from all of said walls.

23. (Amended) A grid as claimed in 1, wherein:

said walls extend between said top and bottom surfaces at respective angles to focus at a point which is at a distance above or below from said top surface of said grid.

27. (Amended) A method for minimizing scattering of electromagnetic energy in an electromagnetic imaging device that is adapted to obtain an image of an object on an imager, comprising:

placing a grid between an electromagnetic energy emitting source of the electromagnetic imaging device and said imager, said grid comprising at least one metal layer including top and bottom surfaces and a plurality of [solid] integrated, intersecting walls, each of which extending from said top to bottom surface and having a plurality of side surfaces, said side surfaces of the walls being arranged to define a plurality of openings extending entirely through said layer, and at least one intersection point of said intersecting walls including additional wall material which extends into at least one of said openings [including at least one projection extending therein]; and

moving said grid in a grid moving pattern while said electromagnetic energy emitting source is emitting energy toward said imager.

34. (Amended) A method as claimed in claim 31, wherein:

at least one intersection point of said intersecting walls including additional wall material which extends into at least one of said openings [including at least one projection extending therein].

37. (Amended) A method for making a grid, comprising at least one layer having a plurality of intersecting walls defining openings therein, and being adaptable for use with electromagnetic energy emitting devices, the method comprising:

applying a resist coating onto a substrate structure;

covering at least a portion of the resist with a first mask having a plurality of apertures therein;

irradiating rays of energy onto the first mask, such that some of the rays of energy enter at least some of the apertures in the mask;

removing the portions of the resist after all required exposures that were irradiated by the rays of energy to create openings in a remaining portion of the resist; and

introducing material into the openings in the remaining portion of the resist such that the material forms the intersecting walls of the at least one layer of the grid, with at least one intersection point of said intersecting walls including additional wall material which extends [projection extending] into at least one of said openings [in the grid].

43. (Amended) A grid, adaptable for use with an electromagnetic energy emitting device, comprising:

at least one metal layer comprising:

top and bottom surfaces; and

a plurality of periodic, [solid] integrated, intersecting walls, each of which extending from said top to bottom surface and having a plurality of side surfaces, said side surfaces of the walls being arranged to define a plurality of openings extending entirely through the layer, at least one of said openings being non-square shaped, and said intersecting walls forming said openings in a periodic pattern in a first direction along said top surface and in a direction perpendicular to said first direction.

45. (Amended) A grid as claimed in claim 43, wherein:

said at least one intersection point of said intersecting walls including additional wall material which extends [said layer includes at least one projection extending] into at least one of said openings.